Exhibit 30

UNITED STATES DISTRICT COURT
SOUTHERN DISTRICT OF NEW YORK

AMY BARTOLETTI, CHIA SIU, NADINE MENTOR, LISA CONLEY AND BRITTANY SHARPTON,	:	
Plaintiffs,	:	No.: 10 Civ. 7820 (JPO)(RLE)
-against-	:	
CITIGROUP, INC. AND CITIGROUP GLOBAL MARKETS, INC.,	:	
Defendants.	:	

Expert Report of Mark R. Killingsworth, D.Phil.

1. I am a professor of economics at Rutgers University, New Brunswick, NJ, where I have been a member of the economics faculty since 1978, and have served as department chairman and director of the graduate program in economics. My background and credentials are set out in the curriculum vitae that appears as Appendix A to this report.

2. I have been retained as a consultant and expert witness by counsel to the plaintiffs in connection with the above-captioned litigation. Plaintiffs' counsel has advised me that the plaintiffs are females who were employed in the Public Finance Department within the Municipal Securities Division of Citigroup Global Markets, Inc. and/or Citigroup, Inc. (collectively, "Citigroup"). Plaintiffs' counsel has further advised me that the plaintiffs allege that, during the course of a reduction-in-force that Citigroup undertook on or about November 21, 2008, Citigroup terminated their employment because of their sex.

3. Plaintiffs' counsel asked me to review data on Citigroup's November 2008 reduction-in-force to determine whether (and if so to what extent) there were sex-related disparities in the composition of terminations within the Public Finance Department ("PFD") during this reduction-in-force ("RIF").

4. To investigate this question, I analyzed data on the sex, termination status (i.e., whether terminated or not) and other characteristics of employees in the PFD immediately prior to the November 21, 2008, RIF.[1] The basic data are set out in Table 1. This shows that, out of 40 female PFD employees, 13 (or 32.5 percent) were terminated. In contrast, out of 119 male PFD employees, 16 (or 13.5 percent) were terminated. The sex disparity in termination rates is very large. Thus, although the female work force was only about one-third of the male work force, almost the same number of women (13) and men (16) were terminated. Likewise, the termination rate of the female PFD employees, 32.5 percent, was 2.4 times that of the male employees, 13.5 percent.

5. Not only is the sex disparity in termination rates large in the ordinary language sense; it is also statistically significant, in the sense that a random process would generate a disparity at least as large as this less than 7 times in 100. The female-male disparity in termination rates is the equivalent of 2.7 "standard errors" (where the conventional threshold for statistical significance of a disparity is 1.96 standard errors or more).

6. I also considered whether the sex disparity in termination rates might be related to employees' years of service, job title, or department. To investigate this, I used a statistical procedure known as probit analysis. This is a well-established and widely-recognized technique for analyzing the relation between an outcome or "dependent variable" in relation to a variety of factors – "independent variables" – that might be related to that outcome. In the present setting, the independent variables are the employee's sex, years of service, job title, and department, and the dependent variable is whether the employee was terminated.

7. Of particular importance here is the fact that probit analysis yields a measure, called the "probit coefficient," of the relation between the dependent variable and each

[1] Specifically, the data include persons in positions with the titles Analyst, Assistant Vice President, Associate, Director, Managing Director, and Vice President. They were employed in departments called Administration, Airports, Central Region, Credit and Financial Products, Financial Structuring, Health Care, Housing Infrastructure, Mid-Atlantic Region, Northeast, Power, Short-Term Group, South East, South West, and West.

independent variable, with all of the other independent variables remaining unchanged. Thus, among other things, the probit analysis yields a measure of the relation between termination and female sex, with the other factors included in the analysis – years of service, job title, and department – remaining the same. In other words, the probit analysis indicates whether female employees are more (or less) likely to be terminated relative to men who are otherwise the same in terms of these other factors (years of service, job title, and department).[2]

8. The results of the probit analysis of terminations are set out in Table 2.[3] The probit coefficient is positive and equal to 1.119, indicating that female employees are more likely to be terminated than male employees who are the same in terms of years of service, job title, and department. Table 2 also shows that this coefficient is the equivalent of 3.123 "standard errors," and is therefore statistically significant. Equivalently, the probability is less than 2 in 1,000 that a random process would generate a probit coefficient at least as large as the one actually obtained here.

9. The results of this probit analysis can also be used to quantify how a change in sex, with all other characteristics remaining unchanged, would change the probability of termination. This is shown in Table 3. This indicates that, out of the 33 female employees included in the probit analysis, the actual percentage terminated was 39.5 percent. However, if their sex were changed to male with all other characteristics (years of service, job title, and department) remaining unchanged, the probit analysis implies that the percentage terminated would fall to 12.2 percent. This is a reduction of over 70 percent in the probability of termination for female PFD employees.

10. Similarly, Table 3 indicates that, out of the 112 male employees included in the probit analysis, the actual percentage terminated was 34.3 percent. However, if their sex were changed to female with all other characteristics (years of service, job title, and department)

[2] For a nontechnical introduction to probit analysis, please see Appendix B.
[3] A total of 145 PFD employees are included in the analysis. A small number of employees are excluded from the analysis because they were in departments in which no terminations occurred.

remaining unchanged, the probit analysis implies that the male employees' percentage terminated would rise to 44.2 percent. This is three times as large as the actual probability of termination for male PFD employees.

11. I conclude that these analyses – particular the probit analysis set out in Tables 2 and 3 – constitute very strong statistical evidence that female PFD employees were substantially more likely to be terminated during the November 2008 RIF than were male PFD employees. In particular, female PFD employees were terminated much more frequently than were male PFD employees who were the same in terms of years of service, job title, and department. This adverse effect for women is large in the ordinary language sense and is clearly statistically significant at conventional test levels.

Mark R. Killingsworth

December 11, 2012

Table 1: Sex difference in termination rates,
Citigroup Public Finance Department, November 2008

		terminated	
employee group	total number	number	% of total
female	40	13	32.5%
male	119	16	13.5%
female-male difference:			19.0%
statistical significance:			
number of "standard errors"			2.700
p-value ("chance probability")			0.0069

The number of standard errors is a measure of the statistical significance of the female-male difference in termination rates. A difference in termination rates that is at least 1.96 standard errors in magnitude is said to be "statistically significant at conventional test levels" or, for short, "statistically significant."

The p-value (sometimes called the "chance probability") for the female-male difference in termination rates appears immediately below the number of standard errors. The p-value gives the probability that a random process would generate a female-male difference in termination rates that is at least as large in absolute value as the one actually obtained in this analysis. A female-male difference in termination rates whose p-value is less than 0.05 is said to be "statistically significant."

Table 2: Female-male difference in probability of termination
for Citigroup Public Finance Department employees, RIF of November 2008
(summary of probit analysis)

	probit coefficient (t-statistic) [p-value]
female-male difference in probability of termination	1.119 (3.123) [0.0018]

Notes to Table 2:

The entry in this table is the coefficient for the indicator variable for female sex in a probit analysis of the probability of being terminated. In addition to the indicator variable for female sex, the analysis also includes variables for years of service, job title, and department. The entry is a measure of the female-male difference in the probability of being terminated for employees who are otherwise the same in terms of the variables considered in the analysis. Because the probit coefficient is positive, this means that the difference in termination probabilities is adverse to females relative to males who are otherwise the same in terms of the other factors considered in the analysis.

The number in parentheses appearing immediately underneath the probit coefficient is its t-statistic (sometimes called the "number of standard errors"). A coefficient whose t-statistic is at least 1.96 is said to be "statistically significant."

The number in square brackets appearing immediately underneath the t-statistic is its p-value (sometimes called the "chance probability"). This gives the probability that a random process would generate a probit coefficient that is at least as large in absolute value as the one actually obtained in this analysis. A coefficient whose p-value is less than 0.05 is said to be "statistically significant."

Table 3: Implications of the probit analyses concerning female-male difference in termination rates, Citigroup Public Finance Department employees, November 2008

females			males		
	probability of termination			probability of termination	
number	actual sex	"reversed" sex	number	actual sex	"reversed" sex
33	0.395	0.122	112	0.143	0.442

Notes to Table 3:

The entries in this table show the implications of the probit analyses of Table 2 concerning sex differences in the probability of termination.

Actual sex. The entries in the column headed "actual sex" represent the probability – calculated for the indicated sex group using the probit results of Table 2 – of being terminated, taking into account each individual's actual characteristics, as measured by the variables considered in the probit analysis, including each individual's actual sex.

Reversed sex. The entries in the column headed "'reversed sex'" represent the probability of being terminated if sex is changed to the opposite of its actual value (i.e., changed to male, for females; or to female, for males), with all other variables remaining unchanged.

Thus, for a given sex (e.g., females), the difference between the "actual sex" and "reversed sex" columns indicates the effect on the probability of termination of switching sex, with all other variables remaining unchanged.

Comparison of the first two columns, for females, indicates that, if other factors were to remain unchanged, changing the sex of females from female to male (with other characteristics remaining unchanged) would reduce females' probability of being terminated from 39.5 percent to 12.2 percent, i.e., would reduce it by about 70 percent.

Similarly, comparison of the third and fourth columns, for males, indicates that, if other factors were to remain unchanged, changing the sex of males from male to female (with other characteristics remaining unchanged) would change males' probability of being terminated from 14.3 percent to 44.2 percent, i.e., would more than triple males' probability of being terminated.

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-against-	:	
CITIGROUP, INC. AND CITIGROUP GLOBAL MARKETS, INC.,	:	
Defendants.	:	

Report of Dr. Mark R. Killingsworth in Rebuttal to Report of Dr. David E. Bloom

1. I am a professor of economics at Rutgers University, New Brunswick, NJ. My background and credentials are set forth in my curriculum vitae, which was attached to my first report in this case as Appendix A. I have been retained as a consultant and expert labor economist by counsel for the Plaintiffs in this litigation. Plaintiffs' counsel has advised me that the Plaintiffs are five females who were employed in the Public Finance Department within the Municipal Securities Division of Citigroup Global Markets, Inc. and/or Citigroup, Inc. (collectively, "Citigroup"). Plaintiffs' counsel has further advised me that the Plaintiffs allege that, during the course of a reduction-in-force ("RIF") undertaken by Citigroup on or about November 21, 2008, Citigroup terminated their employment because of their sex.

2. Plaintiffs' counsel has asked me to use the information currently available[1] to respond to the December 2012 report by Dr. David E. Bloom, who has been retained as an expert by the Defendants.

Introduction

3. Dr. Bloom's report presents analyses of four reductions-in-force (RIFs) that occurred at Citigroup from December 2007 to November 2008. A total of 219 persons were employed at Citigroup during this period, of which 70 were terminated during one of the four RIFs.[2] The five Plaintiffs in this litigation were terminated in the fourth and final RIF. Specifically, Dr. Bloom presents two kinds of analyses: (a) analyses of the relation, within each individual RIF, between the percentage of persons in Citigroup's groups (Housing, Health Care, etc.) who were terminated and the percentage of persons in the groups who were female (Dr. Bloom calls these "cross-group" regressions), and (b) analyses of the relation, within each individual RIF and group, between sex and termination (Dr. Bloom calls these "within-group exact tests").

Dr. Bloom's "cross-group" regressions

4. To perform the "cross-group" regression for each RIF, Dr. Bloom proceeded as follows. First, for each group, he calculated the percentage of persons who were female and the percentage of persons who were terminated. Then, for each RIF, he performed a regression

[1] If additional pertinent information becomes available later, I may decide to incorporate this new information in a revised report.

[2] For ease of reference, I will refer to "Citigroup," but it should be understood that all of the analyses performed by Dr. Bloom (and myself) refer only to employees within Citigroup's Public Finance Department. During the period covered by the RIFs, the Public Finance Department was divided into 16 "groups," with names such as Housing, Health Care, and so on. It should be noted that some of the 16 groups had only a very small number of employees during the period covered by the RIFs (for example, as of the first RIF, the PR Transfer group had one incumbent). Similarly at some points, some of the groups did not have any incumbents (for example, there were no employees in the Administration group as of either the first or the second RIF).

analysis[3] to see if the percentage female and the percentage terminated were correlated. Dr. Bloom found that, for each of the four RIFs, the correlation between the two percentages was not statistically significant.

5. This procedure is a virtual handbook in how not to investigate possible sex differences in termination rates. First, by computing averages for each group (percent female, and percent terminated) before performing any statistical analysis, Dr. Bloom boils down the data from as many as 200 observations to 15 or less. This is shown in Table 1. For example, Table 1 shows that whereas a total of 201 employees were present at Citigroup just before the first RIF, Dr. Bloom's regression analysis has only 15 observations (because there were 15 groups). It does not require advanced training in statistics to understand that a regression analysis like Dr. Bloom's, with such a small number of observations, is unlikely to produce meaningful (or statistically significant) results.

6. In addition, although the employees in the different groups differ from one another in terms of such things as seniority and job title, Dr. Bloom's cross-group regressions do not take any of these differences into account. (This is especially perplexing because, in his discussion of his within-group exact tests, Dr. Bloom insists on the importance to taking account of job title.) Moreover, although the dependent variable in Dr. Bloom's regression – the percentage terminated – has a strict lower bound of zero and a strict upper bound of one, the particular regression technique that Dr. Bloom uses does not take account of this, and is capable of predicting termination rates that are negative or exceed 100 percent.

7. Finally, Dr. Bloom's cross-group regressions consider each RIF in isolation from the others, even though all of the RIFs occurred within a relatively short span of time.

[3] For a simple introduction to regression analysis, please see Appendix B to my first report.

8. To correct these defects, I have analyzed terminations across the entire period covered by the available data, i.e., from December 2007 to November 2008 (for short, the "RIF period"). I began by identifying the first appearance in the available data of each person who was present at any point during the RIF period, and determined his or her job title, group, and seniority as of that date. (Persons who were hired within the RIF period are separately identified as new hires.) I then performed a probit analysis[4] of terminations over the RIF period, taking account of each employee's sex, seniority, job title and group.

9. The results of this analysis appear in Table 2. As shown there, the probit coefficient is positive and equal to 0.657, indicating that female employees are more likely to be terminated than male employees who are the same in terms of years of service, job title, and group. Table 2 also shows that this coefficient is the equivalent of 2.682 "standard errors," and is therefore statistically significant. Equivalently, the probability is less than 8 in 1,000 that a random process would generate a probit coefficient at least as large as the one actually obtained here.

10. The results of this probit analysis can also be used to quantify how a change in sex, with all other characteristics remaining unchanged, would change the probability of termination. This is shown in Table 3. Out of the 54 female employees included in the probit analysis, the actual percentage terminated was 44.3 percent. However, if their sex were changed to male with all other characteristics (years of service, job title, and group) remaining unchanged, the probit analysis implies that the percentage terminated would fall to 23.9 percent. This is a reduction of almost 50 percent in the probability of termination for female PFD employees.

[4] Probit analysis is a form of regression analysis. Unlike the version of regression analysis used by Dr. Bloom, probit analysis explicitly takes account of the fact that a probability (e.g., of termination) must always be between zero and one.

11. Similarly, Table 3 indicates that, out of the 159 male employees included in the probit analysis, the actual percentage terminated was 28.4 percent. However, if their sex were changed to female with all other characteristics (years of service, job title, and group) remaining unchanged, the probit analysis implies that the male employees' percentage terminated would rise to 50.6 percent. This is 75 percent larger than the actual probability of termination for male PFD employees.

12. I conclude that the analyses in this report and in my first report constitute very strong statistical evidence that female PFD employees were substantially more likely to be terminated than male PFD employees, both during the November 2008 RIF and during the entire RIF period. In particular, female PFD employees were much more likely to be terminated than were male PFD employees who were the same in terms of years of service, job title, and group. This adverse effect for women is large in the ordinary language sense and is clearly statistically significant at conventional test levels.

Dr. Bloom's "within-group exact tests"

13. Dr. Bloom also conducts a series of statistical analyses that he calls "within-group exact tests." These tests use either (a) a statistical procedure called Fisher's Exact Test or (b) a statistical procedure called a test of conditional independence. In both cases, Dr. Bloom says that his analyses do not provide any indication of statistically-significant differences in termination rates between men and women.

14. Dr. Bloom's tests using the Fisher's Exact procedure consider employees holding particular job titles or groups of job titles (e.g., directors, or directors and vice presidents, etc.) within the particular group in which each Plaintiff was employed (e.g., the housing group, in the case of Ms. Bartoletti). Dr. Bloom then uses Fisher's Exact Test to determine whether, for that

job title (or set of job titles) within that group, the female-male difference in termination rates is statistically significant. He finds that the sex difference in termination rates within these sets of employees is never significant. He concludes that these results "offer no statistical support" for an allegation of gender discrimination in terminations.

15. However, Dr. Bloom's reasoning is flawed. A more appropriate characterization of these results is that, because the number of employees considered in each of the analyses is so small, the analyses have virtually no power to discern meaningful evidence on gender differences in terminations.[5]

16. To see this in detail, it is instructive to consider Table 4, where I have summarized the numbers of men and women in each of the analyses of RIF #4 that Dr. Bloom conducts using Fisher's Exact Test. This shows, for example, that the first of his tests for Ms. Bartoletti's group (housing) was based on data for persons employed as directors. In this sample, there was one woman, who was terminated, and one man, who was retained. It will come as no surprise to see that this difference is not "statistically significant." Likewise, the second of Dr. Bloom's tests for Ms. Bartoletti's group was based on data for persons employed as directors or vice presidents. In this second sample, there were two such women, both of whom were terminated; and there was one man, who was retained. Again, unsurprisingly, this difference is not "statistically significant."

17. As Table 4 readily confirms, the numbers in each of the samples are very small indeed. And common sense (as well as statistical theory) tells us that, when the number of observations in a study is very small, it is unrealistic to expect the results to be meaningful. Indeed, in numerous instances shown in Table 4, the termination rate of women is 100 percent

[5] Analogously, one could say an opinion poll of five or ten persons would "offer no statistical support" for the proposition that one electoral candidate is leading another. However, few people would expect such a poll to provide any meaningful evidence on this proposition.

and the termination rate of men is either much lower or is actually zero, and yet the gender difference in termination rates is not "statistically significant." Of course, this indicates little or nothing about sex differences in termination rates; it simply indicates that the numbers of persons (both female and male) are so small that it is not possible to draw meaningful statistical conclusions.

18. Dr. Bloom's second set of within-group exact tests uses a statistical procedure known as a test of conditional independence. Dr. Bloom uses the test of conditional independence in order to determine whether, once job title is taken into account, there is evidence of a sex difference in termination rates within an employee group (e.g., housing or infrastructure). In intuitive terms, the test of conditional independence is a means of combining a set of Fisher's Exact Tests for individual job titles, and may be viewed as a generalization of the Fisher's Exact Test.

19. As Dr. Bloom notes, applying the test of conditional independence is not altogether straightforward, because, for several reasons, employees may be dropped from the analysis. In particular:

(a) If everyone holding a particular job title in a given group is terminated, the employees holding that title will be dropped from the analysis.

(b) Likewise, if no one holding a particular job title in a given group is terminated, the employees holding that title will also be dropped from the analysis.

(c) Finally, if a job title is single-sex – has only men or only women incumbents – the employees holding that title will also be dropped from the analysis.

20. With this in mind, now consider Table 5. This shows the particular employee group and set of job titles considered in Dr. Bloom's test of conditional independence for RIF #4

for each of the Plaintiffs. For example, Table 5 shows that in Ms. Bartoletti's group, housing, there were employees holding four titles: analyst, associate, vice president, and director. Table 5 also shows the number of men and women in each title and whether they were terminated. Finally, Table 5 shows the titles and numbers of persons which will be excluded from the test of conditional independence due to one of the reasons (a)-(c) given above.

21. The numbers of employees who survive this culling process, and who are in job titles that are eligible for inclusion in the test of conditional independence, are generally quite small. Once again, Dr. Bloom reports that his tests provide no indication of "statistical significance" of any sex difference in termination rates. However, the wonder is why, with such small numbers, anyone would have thought that these tests would provide an indication of anything meaningful.

22. In sum, I see nothing in any of Dr. Bloom's analyses that causes me to alter the conclusion in my previous report that there is strong statistical evidence of a sex difference in termination rates to the disadvantage of women during the November 2008 RIF at Citigroup. Indeed, I believe that the new analysis that I have reported here (see in particular Tables 2 and 3) provides strong statistical evidence of a sex difference in termination rates to the disadvantage of women over the entire RIF period.

Mark R. Killingsworth

February 12, 2013